DOCUMENT RESUME

ED 069 761 TM 002 216

AUTHOR	Wetter, Jack; And Others
TITLE	Functional Analysis of Intelligence Test Performance of Children with Learning Problems.
PUB DATE	[71]
NOTE	8p.
EDRS PRICE	MF-$0.65 HC-$3.29
DESCRIPTORS	Attention Span; *Behavior Problems; *Factor Analysis; Formative Evaluation; Hyperactivity; *Intelligence Tests; *Learning Disabilities; Males; *Psychoeducational Processes; Research Methodology; Retarded Children; Test Results; Verbal Tests
IDENTIFIERS	Wechsler Intelligence Scale; WISC

ABSTRACT

WISC performance of 77 boys with serious school learning problems was analyzed according to three factors hypothesized to reflect functional differences in learning styles. Sub-samples identified as Learning Disordered, Learning Disordered-Hyperactive, or Educable Mentally Retarded, differed in patterns of subtest scores, although within groups Verbal-Performance I.Q.'s were not significantly different. Attentional difficulties in hyperactive learning disordered children was confirmed. Specification of areas of strength and weakness through the proposed process analysis is suggested as a basis for differentiated remedial program planning. (Author)

ED 069761

TM 002 216

Functional Analysis of Intelligence Test Performance of Children with Learning Problems

Jack Wetter Barbara K. Keogh Ann McGinty

University of California, Los Angeles

Genevieve Donlon

Miami, Florida

Abstract

WISC performance of 77 boys with serious school learning problems was analyzed according to three factors hypothesized to reflect functional differences in learning styles. Sub-samples identified as Learning Disordered, Learning Disordered-Hyperactive, or Educable Mentally Retarded, differed in patterns of subtest scores, although within groups Verbal-Performance I.Q.'s were not significantly different. Attentional difficulties in hyperactive-learning disordered children was confirmed. Specification of areas of strength and weakness through the proposed process analysis is suggested as a basis for differentiated remedial program planning.

Functional Analysis of Intelligence Test Performance of Children with Learning Problems

Jack Wetter Barbara K. Keogh Ann McGinty

University of California, Los Angeles

Genevieve Donlon

Miami, Florida

Rationale. A major role of psychologists in school programs has to do with evaluation of children for purposes of categorization, special placement, and differential program planning. Many school psychologists base their decisions on summarizing or unitary scores derived from children's performance on a set of standardized instruments: an intelligence test, a short form achievement test, and a perceptual-motor task. Reliance is on norm-referenced, quantitative interpretations which do not provide direction for development of remedial strategies for individual children. Emphasis on quantitative scores, thus, directs placement, not remediation.

Concern for functional analysis of performance has lead to increased interest in psychoeducational evaluation which gets at process variables. How children approach and attempt to solve school tasks and the strategies they utilize in learning are important considerations for psychologists. Particularly relevant to a functional analysis is the extensive theory and empirical work on various aspects of perceptual and cognitive styles. Investigators of cognitive styles have documented consistent differences in ways in which individuals attend to, select, and organize information in a learning setting. Many of these differences appear directly applicable to implementation of educational instructional programs. Yet, too often

diagnostic reports contain only quantitative summaries of children's performance relative to chronological or mental age expectancies. Extensive documentation of WISC performance of groups of adequate and disabled readers, for example, has confirmed that there are often differences between groups on verbal and performance scores, and that certain subtests are more discrepant than others (Huelsman, 1970). Functional interpretations, reasons for differences between groups, and possible use of such information in educational programming, however, are usually unspecified. The problem appears less in the instruments employed and more in the "set" the psychologist brings to the interpretation.

The work of H.A. Witkin and his associates (Witkin, Dyk, Faterson, Goodenough, & Karp, 1962) provides a possible direction to functional or process analysis. The Witkin group has developed a number of tests to assess various aspects of perceptual organization, and has applied their field articulation construct to analysis of performance on standard measures of intelligence. Witkin et al (1962) propose that WISC subtests fall into three major factors tapping three relatively independent functions. In their view, a Verbal-Comprehension factor is composed of subtests of Information, Vocabulary, and Comprehension; an Analytic-Field-Approach factor is made up of Object Assembly, Block Design, and Picture Completion subtests; and, an Attention-Concentration factor is composed of subtests of Arithmetic, Digit Span, and Coding. Although the Witkin WISC factors are not as pure as might be desired, grouping of subtests within this framework allows opportunity for specification of problem-solving functions which can be built into school performance. Witkin, Faterson, Goodenough, and Birnbaum (1966) found retarded boys particularly low on scores on the Verbal-Comprehension factor, but noted that a number of boys in their sample demonstrated adequate ability on subtests tapping Attention

or Analytic factors. Witkin, et al suggest that many retarded children may have skills in areas of ability often overlooked in the heavily weighted verbal test batteries. This seems particularly important in evaluation of minority children, an interpretation which receives some independent support from Mercer's (1971) work on adaptive ability of minority children classified as retarded. This approach to a WISC subtest interpretation is also consistent with the process analysis proposed by Keogh (1971) for differentiation of learning problems of hyperactive children. The Witkin three factor approach to WISC analysis appears promising.

Purpose. This study was designed to investigate functional patterns of intelligence performance of children with severe learning and behavior problems. In specific, WISC subtest patterns of mentally retarded, learning disordered, and hyperactive-learning disordered children were analyzed in terms of three factors hypothesized to reflect process or functional aspects of intellectual performance.

Subjects. Three independent samples were included: 26 boys in public school classes for educable mentally retarded (EMR); 24 private school children with serious learning and behavior problems (LD); and 26 boys referred to a Pediatric Learning Disability Clinic for evaluation of hyperactivity and learning problems (LD-HA). CA means and SD were 140.0 and 14.99, 121.7 and 16.53, and 118.0 and 20.9 months for the three groups, respectively. WISC Verbal, Performance, and Full Scale I.Q. means and standard deviations were 73.07 and 5.90, 80.52 and 10.40, and 74.26 and 7.67 for the EMR sample. Comparable values were 102.46 and 15.37, 103.21 and 15.58, and 103.13 and 15.62 for the LD group, and 103.38 and 11. 76, 104.62 and 13.25, and 104.12 and 10.83 for the LD-HA group, respectively. Ethnic representation was

comparable in the LD samples, but more minority children were in the EMR group.

Procedures. All subjects had been given intelligence tests as part of a diagnostic evaluation. Scaled scores for WISC subtests were analyzed according to three factors: Verbal-Comprehension, Attention-Concentration, and Analytic-Field-Approach. Subtest composition of factors has already been described. Factor scores used in this analysis represented the total scaled score value of the three subtests composing each factor. In the case of some EMR subjects, it was necessary to prorate a single factor value when one subtest was missing.

Results and Discussion. Data was organized to compare factor scores within and across groups. Means and standard deviations of factor scores for the three samples are found in Table 1.

(Table 1 inserted here.)

EMR factor means were clearly different from the two LD groups. Of more interest were within group differences, tested with a series of repeated measures one way analyses of variance. Factor scores within EMR and LD-HA groups were significantly different ($F = 8.29$ and 22.17, $P < .01$ respectively), and in the expected direction for the LD sample.

Examining, first, patterns of EMR performance, lowest mean scores were in Verbal-Comprehension items, highest in Analytic subtests, differences consistent with findings reported by Witkin et al (1966). It is important to note that many of these EMR subjects were from Spanish-speaking families; their identification as EMR may have been heavily influenced by specific limitations in verbal abilities. A number of boys in the EMR group had Analytic or Attention factor scores within a low normal or normal range,

suggesting that potential strengths in other abilities may have been underestimated or overlooked.

In contrast to the EMR sample, both LD groups were at least adequate in Verbal and Analytic abilities, their poorest performance evidenced on Attention-Concentration factor items. This pattern was especially noticeable for the sample referred with a major complaint of hyperactive behavior (LD-HA sample). Analysis of the three WISC subtest patterns for this group provides some confirmation of attentional difficulties in the learning problems of hyperactive children. It is of interest to note that differential patterns of performance were not reflected in WISC Verbal-Performance I.Q.'s. More important than confirmation, however, is the possible use of factor patterns in the development of remedial programs for individual children. Functional characteristics of children with severe school learning problems are varied, suggesting, therefore, the importance of differentiated remedial strategies. Specification of particular areas of strength and weakness through the proposed process analysis may provide a basis for individualized program planning.

TABLE 1

Means and Standard Deviations of Verbal-Comprehension, Analytic, and Attention-Concentration Factor Scores For EMR, LD, and LD-HA groups

Sample	Verbal		Analytic		Attention	
	M	SD	M	SD	M	SD
EMR (N=26)	17.04	3.41	21.78	5.09	18.15	4.51
LD (N=24)	31.83	8.35	32.46	7.30	28.25	9.13
LD-HA (N=26)	31.08	5.80	34.23	5.87	25.69	3.97

REFERENCES

Huelsman, C.B. The WISC subtest syndrome for disabled readers. Perceptual Motor Skills, 1970, 30 535-550

Keogh, B.K. Hyperactivity and learning disorders: Review and speculation. Exceptional Children, 1971, 38 101-110

Mercer, J.R. The meaning of mental retardation. In R. Koch and D. Dobson (Eds.), The Mentally Retarded Child and His Family. New York: Brunner, Mazel, Inc. 1971.

Witkin, H.A., Dyk, R., Faterson, H., Goodenough, D., and Karp, S. Psychological differentiation. New York: John Wiley, 1962.

Witkin, H.A., Faterson, H.F., Goodenough, D.R., Birnbaum, J. Cognitive patterning in mildly retarded boys. Child Development, 1966, 37 301-316